

Interactive comment on “Chemical and physical characteristics of aerosol particles at a remote coastal location, Mace Head, Ireland, during NAMBLEX” by H. Coe et al.

Anonymous Referee #1

Received and published: 12 January 2006

This paper reports on the characterisation of the aerosols (aerosol number concentrations and size distributions from 3 nm to 20 μm) at the Mace Head Atmospheric Research Station, Ireland, during the Namblex campaign. This is a coastal site on the eastern seaboard of the North Atlantic Ocean.

The aerosols were both characterised on- and off-line by means of various devices such as an Aerodyne Aerosol Mass Spectrometer (AMS), ion chromatographic analysis

In addition, particle number concentrations, size distributions and AMS measurements

Full Screen / Esc

Print Version

Interactive Discussion

Discussion Paper

were determined at 7 and 22 m above ground level to investigate local effects on the aerosol size distribution induced by the tidal zone.

It seems to me that clearly the experiments were conducted according the current state-of-the-art, the data are qualitatively discussed and some potentially interesting conclusions are drawn. Therefore, the subject and methods used are clearly within the scope of this journal and certainly of use to wider community.

However I'm slightly confused by the manuscript layout. Indeed, while I'm intimately convinced of the inherent quality of these data, the latter are not presented nor their importance really demonstrated. My understanding is that these data may be of use for other aspects of the Namblex campaign but that unfortunately some "cuts" have been made for the publication process as a special issue. (I do hope that my understanding is not too far off compared to reality).

I would therefore recommend that the authors think about connecting their data more to other aspects of the Namblex or if not possible to try to make a better use of their data.

Indeed, in the current version of this manuscript, the reader may have an impression that it is just a short (not so precise) overview of the data but without really using them. I do think that this should be strictly avoided. (Taking into account the quality of the data and authors, re-editing the manuscript should straightforward!).

For instance, the abstract should be changed in order to really make clear what the goals of this study were. Also more information should be given about the strategy that was adopted to achieve the goals. In the current abstract version, the sentences about the lifetime are really difficult to follow and not directly linked to the previous parts.

Also, in the following sections, the goals strategy, achievements should be made clear! Sometimes, the reader may have the (wrong) impression that the manuscript is a literature review and not based on a precise field campaign.

Full Screen / Esc

Print Version

Interactive Discussion

Discussion Paper

Interactive
Comment

On page 11654, line 10, a value of 0.2 is given for an uptake coefficient. But to what does it refer (which gas on which surface)?

On page 11657, line 1, to which equation is this referring? I guess not to the previous one)?

Also the “Schwartz” equation was used to describe the uptake of gases. While it provides comparable results to the more exact treatment by Fuchs and Sutugin in most cases, it still differs especially for small particles. Has this been taken into account (especially as the data are covering a wide range of sizes)?

In the case of HO₂ and HOI, the uptake may not be simply driven by the physical uptake (i.e., transport into the aerosol phase) as these gases are quite reactive! How would surface/condensed phase chemistry alter the conclusions drawn in this manuscript?

Figure is referred as providing lifetimes (see page 11656) but it is not the case! Also, the authors should define their lifetimes as this terminology may carry many different aspects (especially for aerosol chemistry). Also, a lifetime should be assigned to a specific gas as depending on their nature the physical and chemical behaviour might totally different.

How the diffusion limitations to mass transfer connect with the composition of the particles? The gases addressed in each section are different!

I do think that the section on the chemical composition should be extended in order to provide more insights.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 11643, 2005.

[Full Screen / Esc](#)[Print Version](#)[Interactive Discussion](#)[Discussion Paper](#)